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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Jori Arrakoski

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ALSTON & BIRD LLP

BANK OF AMERICA PLAZA

101 SOUTH TRYON STREET, SUITE 4000

CHARLOTTE, NC 28280-4000

EXAMINER

SCHEIBEL, ROBERT C

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/089,326	Applicant(s) ARRAKOSKI ET AL.	
	Examiner ROBERT C. SCHEIBEL	Art Unit 2419	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 36-69, 71, 72, 80-84, 87 and 88 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 36-40, 46-50, 52-58, 66-68, 71, 72, 80-84, 87 and 88 is/are rejected.
- 7) ☒ Claim(s) 41-45, 51, 59-65 and 69 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/10/09</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

- Examiner acknowledges receipt of Applicant's Request for Continued Examination (RCE) filed 3/10/2009.
- Claims 36, 41, 52-69, 71, 72, 87, and 88 are currently amended.
- Claims 36-69, 71, 72, 80-84, 87, and 88 are currently pending.

Response to Arguments

1. Applicant's arguments, see page 13, filed 3/10/2009, with respect to the objection to claim 52 have been fully considered and are persuasive. The objection to claim 52 has been withdrawn.

2. Applicant's arguments, see pages 13-14, filed 3/10/2009, with respect to the rejection of claims 52, 71, 72, and 80-84 under 35 U.S.C. 112, second paragraph have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground of rejection is made under 35 U.S.C. 112, first paragraph.

The claims have overcome the previous rejection in that there is some structure claimed for the communications unit. However, the claim is now rejection under 35 U.S.C. 112, first paragraph, as it contains a single means (a first mesh network sing node unit) for performing the functionality of the claim (wirelessly communicating).

3. Applicant's arguments, see page 14, filed 3/10/2009, with respect to the rejection of claims 87 and 88 under 35 U.S.C. 112, second paragraph, have been fully considered and are

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persuasive. The rejection of claims 87 and 88 under 35 U.S.C. 112, second paragraph, has been withdrawn.

However, these claims are rejected herein as there is no support in the original disclosure for the processor, memory or computer readable storage medium specified in these claims.

4. Applicant's arguments, see pages 14-15, filed 3/10/2009, with respect to the rejection of claim 87 under 35 U.S.C. 101 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground of rejection is made as there is no support in the original disclosure for the processor, memory or computer readable storage medium specified in these claims.

5. Applicant's arguments, see pages 15-16, filed 3/10/2009, with respect to the rejection of claims 36, 52, 53, 87, and 88 under 35 U.S.C. 102 have been fully considered but they are not persuasive.

Applicant argues that the new limitation that the connection between the first mesh network tier sing node unit and a second mesh network tier unit is a dedicated connection distinguishes these claims from the Haas reference due to the fact that Haas deals with ad-hoc networks.

However, Examiner respectfully disagrees. The language "dedicated connection" is rather broad and in fact is disclosed by Haas. The previous rejection relied upon the connection between CH1 and CH2 for this connection. Examiner maintains that this is a dedicated

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connection in that the connection (while not permanent) is dedicated for use by these two devices (as opposed to a broadcast channel, for example, which would not be a dedicated channel).

In reviewing the specification, Examiner believes there are numerous details of the present invention that could be used to amend the present claims to distinguish the invention from the prior art of record. Examiner recommends further claim amendments to distinguish the claims from the prior art of record.

6. Applicant's arguments, see page 16, filed 3/10/2009, with respect to the rejection of claim 54 under 35 U.S.C. 102 have been fully considered but they are not persuasive.

Applicant submits that the addition of the limitation that one of the first or second mesh network tiers is a preconfigured mesh tier distinguishes the claim from the Haas reference.

However, Examiner respectfully disagrees. The language "preconfigured mesh tier" is rather broad. There are in fact certain aspects of the first tier of Haas which are preconfigured and Examiner maintains that this thus teaches the limitation that it is a preconfigured mesh tier. Consider lines 13-16 of column 5, for example, which indicates that the routing zones for a given node is those nodes which fall within a distance which is less than a "predefined maximal number". This concept is one of the key means by which Haas minimizes the cost of topological updates and improves upon the prior art. Further, the clusters of the first tier have a cluster head which routes traffic between clusters. This cluster head "routes between the cluster head and the cluster node" as indicated in lines 39-46 of column 8. Clearly, the nodes belonging to each cluster are within a distance defined by the "predefined maximal number" as they must fall

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within the cluster head's routing zone. Thus, the tier 1 clusters are in this sense a preconfigured mesh tier as the cluster membership is defined by the preconfigured "maximal number".

As indicated above, Examiner believes there are numerous details of the present invention that could be used to amend the present claims to distinguish the invention from the prior art of record. Examiner recommends further claim amendments to distinguish the claims from the prior art of record. Further, some of the dependent claims have been indicated below as including allowable subject matter.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claim **54** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Specifically, claim 54 is a single means claim. Claim 54 recites a communications unit comprising a single means (a first mesh network tier sink node unit) for (configured to) implementing a function (communicating with at least one of a plurality of first mesh network tier subscriber units and a second mesh network tier subscriber unit). As indicated in MPEP §

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2164.08(a), this claim covers every conceivable means/structure for achieving the stated purpose, but the specification supports only those means known to the inventor.

9. Claims **87 and 88** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Specifically, the specification does not properly support the software implementation specified in these claims. There is no discussion in the original specification, drawings, or claims of a processor, memory, or computer readable storage medium or the use of these components as indicated in the claims to implement the invention.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims **36, 37, 46, 47, 49, 50, 52-55, 67, 68, 70, 71, 80, 81, 83, 84, 87, and 88** are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,304,556 to Haas.

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Regarding claim **36**, Haas discloses a communications system comprising: a hierarchical mesh network comprising at least a first mesh network tier and a second mesh network tier (shown in Figure 3):

the first mesh network tier (tier-1 network 24 of Figure 3) comprising a plurality of first network subscriber units (the nodes shown in tier-1 network 24 of Figure 3) and a first network sink node unit (cluster head CH1) configured to wirelessly communicate with the first network subscriber units (see lines 30-31 of column 2); and

the second mesh network tier (tier-2 network 32 of Figure 3) geographically at least partly overlapping the first network (Figure 3 indicates that these networks at least partially geographically overlap) and comprising a plurality of second mesh network tier subscriber units (CH1, CH2, CH4 of Figure 3) and a second mesh network tier sink node unit (CH3 which is indicated as the cluster head of network 32) configured to wirelessly communicate with the second mesh network tier subscriber units (see lines 30-31 of column 2) ; and

a dedicated connection between the first mesh network tier sink node unit and a second mesh network tier unit configured to communicate in the second network (CH1 is the first mesh network sink node unit and it is connected to CH2 which is a second mesh network tier unit; the connection is dedicated for use by these two nodes as shown in Figure 3), whereby one of the first network subscriber units is configured to be provided with a communication path via the first mesh network tier sink node unit to said second mesh network tier unit (see lines 50-59 of column 8).

Regarding claims **52 and 53**, Haas similarly discloses the analogous limitations of these claims.

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Regarding claim **54**, Haas discloses an apparatus for operation in a communications system comprising at least a first mesh network tier and a second mesh network tier (shown in Figure 3),

the second mesh network tier (tier-2 network 32 of Figure 3) geographically at least partly overlapping the first network (Figure 3 indicates that these networks at least partially geographically overlap) and comprising a second sink node (CH3 which is indicated as the cluster head of network 32) and a plurality of second communication terminals (CH1, CH2, CH4 of Figure 3) configured to wirelessly communicate with the second sink node (see lines 30-31 of column 2), the apparatus configured to:

operate as a first sink node (cluster head CH1) configured to be in wireless communication (see lines 30-31 of column 2) with a plurality of first communication terminals (the nodes shown in tier-1 network 24 of Figure 3);

wherein the first sink node is further configured to operate as a second communication terminal for providing one of the first communication terminals with communications access to the second mesh network tier (see lines 50-59 of column 8), and wherein one of the first mesh network tier or the second mesh network tier is a preconfigured mesh tier (see lines 13-16 of column 5, for example, which indicates that the routing zones for a given node is those nodes which fall within a distance which is less than a “predefined maximal number”; further, the clusters of the first tier have a cluster head which routes traffic between clusters and this cluster head "routes between the cluster head and the cluster node" as indicated in lines 39-46 of column 8; clearly, the nodes belonging to each cluster are within a distance defined by the “predefined maximal number” as they must fall within the cluster head’s routing zone and thus, the tier 1

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clusters are in this sense a preconfigured mesh tier as the cluster membership is defined by the preconfigured “maximal number”).).

Regarding claims **87, and 88**, Haas similarly discloses the analogous limitations of these claims.

Regarding claim **37, 55, and 71**, Haas discloses the limitation that wireless communication in the first mesh network tier is independent of wireless communication in the second mesh network tier (see lines 45-46 of column 8).

Regarding claim **46**, Haas discloses throughout the limitation that the communication is data communication. Consider, for example, the discussion in lines 14-36 of column 3 which discussed routing packets which clearly contain data of some type.

Similarly, regarding claim **47**, Haas discloses the limitation that the communication is packet data communication. Again, consider the discussion in lines 14-36 of column 3 which discussed routing packets which clearly contain data of some type.

Regarding claims **49, 67, and 83**, Haas discloses the limitation that said communication in the first mesh network tier is radio communication (see claims 30-34 of column 2).

Regarding claims **50, 68, and 84**, Haas discloses the limitation that said communication in the second mesh network tier is radio communication (see claims 30-34 of column 2).

Regarding claim **80**, Haas discloses throughout the limitation that the communications unit is configured to wirelessly communicate data. Consider, for example, the discussion in lines 14-36 of column 3 which discussed routing packets which clearly contain data of some type as well as lines 30-34 of column 2 which indicates that this communication can be wireless.

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Similarly, regarding claim **81**, Haas discloses the limitation that the wireless data communication is packet data communication. Again, consider the discussion in lines 14-36 of column 3 which discussed routing packets which clearly contain data of some type.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims **38, 39, 40, 48, 56, 57, 58, 66, 72, 73, 74, and 82** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,304,556 to Haas in view of U.S. Patent 6,751,455 to Acampora.

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Regarding claims **38, 56, and 72**, Haas discloses all limitations of parent claims 37, 55, and 71. However, Haas does not disclose expressly the limitation that wireless communication in the first mesh network tier is in a different frequency band from wireless communication in the second mesh network tier.

Acampora discloses the concept of using separate frequencies in each tier of a two-tier network architecture in lines 58-65 of column 6. Haas and Acampora are analogous art because they are from the same field of endeavor of wireless ad hoc networking. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Haas to use a different frequency in each tier of the network. The motivation for doing so would have been to allow communications at the two tiers to remain separate and not interfere with each other. Therefore, it would have been obvious to combine Acampora with Haas for the benefit of minimizing interference between the tiers to obtain the invention as specified in claims 38, 56, and 72.

Regarding claims **39 and 57**, Haas and Acampora disclose the limitations of parent claims 38 and 56, as indicated above. However, Haas does not disclose the limitation that the first mesh network tier comprises a plurality of first network sink node units with which the first mesh network tier subscriber units are configured to wirelessly communicate.

Acampora discloses the concept of multiple sink nodes in a tier throughout. In Acampora, the agents are the sink nodes at the first tier and Acampora suggests the use of “one or more proximately-located agents” in the abstract, for example. Haas and Acampora are analogous art because they are from the same field of endeavor of wireless ad hoc networking.

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At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Haas to use a plurality of sink nodes in the first tier. The motivation for doing so would have been make the network more robust in the event of a failure of a sink node as well as to reduce the capacity requirements placed upon a single sink node. Therefore, it would have been obvious to combine Acampora with Haas for the benefit of improved robustness and capacity to obtain the invention as specified in claim 39 and 57.

Regarding claims **40 and 58**, Haas discloses the limitation that the system comprises a plurality of connections, each connection being between a respective first mesh network tier sink node unit and a respective second mesh network tier unit whereby one of the first mesh network tier subscriber units is configured to be provided with a communication path via the respective first mesh network tier sink node to respective second mesh network tier unit (see the plurality of connections in Figure 3 between first tier sink node CH 1 and second tier units CH 2 and CH 4, for example).

Regarding claim **48, 66, and 82**, Haas discloses that the communication is packet data communications, but does not expressly disclose that it uses an internet protocol. Haas suggests that this may be a means of interconnecting separate ad hoc networks in lines 3-9 of column 2. Acampora discloses connecting the two-tiered network to the Internet which discloses the limitation that the communication uses an internet protocol. At the time of the invention, it would have been obvious to one of ordinary skill in the art to use an internet protocol with the

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Haas system. The motivation for doing so would have been to allow the clients in Haas to communicate easily with users outside the ad hoc network.

Allowable Subject Matter

15. Claims **41-45, 51, 59-65, and 69** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT C. SCHEIBEL whose telephone number is 571-272-3169. The examiner can normally be reached on Mon-Fri from 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wing F. Chan can be reached on 571-272-7493. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ROBERT C. SCHEIBEL
Examiner
Art Unit 2419

/R. C. S./
Examiner, Art Unit 2419

/Hong Cho/
Primary Examiner, Art Unit 2419